

# CORROSION

VOLUME 23

JANUARY 1—DECEMBER 31

1967

## C O N T E N T S

Tables of Contents

Alphabetical Subject Index

Alphabetical Index to Authors

## JANUARY

Oxidation  
Mix  
J.

Relaxation  
Mechanisms  
Crack  
J.

Stress  
Symposium  
Mill

Anodic  
Under  
Aquatic  
J. S.  
J. V.

Reaction  
-A  
Fra

Capacity  
Acting  
Technique  
and

Errata

## FEBRUARY

Dissolution  
I. U.  
Kinetics

A Contaminant  
Stress  
Austenite  
Magnetic  
Heinz

High Temperature  
Evaporation  
Hastings  
and

## MARCH

Use of  
Production  
Boiling  
L. E.  
M. C.

Effect  
on Corrosion  
Mechanisms  
J. E.

Hot Corrosion  
by P.

# Table of Contents

CORROSION, Vol. 23, 1967

## JANUARY

Oxidation of Fe-Ti Alloys in Co-CO <sub>2</sub> Mixtures, by Gordon H. Geiger and J. Bruce Wagner, Jr. . . . .	1
Relationships Between Electrochemical Measurements and Stress Corrosion Cracking of Maraging Steel, by J. A. S. Green and E. G. Haney . . . .	5
Stress Corrosion of Beryllium in Synthetic Sea Water, by R. A. Miller, J. R. Myers and R. K. Saxer. .	11
Anodic Disintegration of Metals Undergoing Electrolysis in Aqueous Salt Solutions, by William J. James, M. E. Straumanis and J. W. Johnson . . . . .	15
Reaction Rate of Sulfur With Lead -A Technical Note, by Frank Fradin and J. Bruce Wagner, Jr. . . . .	24
Capacitance Measurements During Activation of Passive Nickel -A Technical Note, by R. R. Sayano and Ken Nobe. . . . .	27
Errata . . . . .	14

## FEBRUARY

Dissolution Kinetics of Nuclear Fuels 1. Uranium 2. Thorium, by L. E. Kindlimann and N. D. Greene. . . . .	29
A Contribution to the Examination of Stress Corrosion Cracking of Austenitic Stainless Steels in Magnesium Chloride Solutions, by Heinz Kohl . . . . .	39
High Temperature Corrosion and Evaporation of Haynes 25 and Hastelloy X-280 by L. A. Charlot and R. E. Westerman . . . . .	50

## MARCH

Use of Ammonia to Suppress Oxygen Production and Corrosion in Boiling-Water Reactors, by L. E. LeSurf, P. E. C. Bryant and M. C. Tanner . . . . .	57
Effect of Organic Corrosion Inhibitors on Corrosion Fatigue, by Parviz Mehdizadeh, R. L. McGlasson and J. E. Landers. . . . .	65
Hot Corrosion of Gas Turbine Alloys, by P. A. Bergman . . . . .	72

## APRIL

An Extreme-Value Statistical Analysis of Maximum Pit Depths and Time to First Perforation, by Howard F. Finley . . . . .	83
Factors Affecting Water Content Needed to Passivate Titanium in Chlorine, by E. E. Millaway and M. H. Kleinman . . . . .	88
Liquidus Curves and Corrosion of Fe, Cr, Ni, Co, V, Cb, Ta, Ti, and Zr in 500-750 C Mercury, by John R. Weeks . . . . .	98
A Technical Note-Corrosion Tunnels in Stainless Steels, by J. S. Armijo and B. E. Wilde. . . . .	107
Effect of Halide Additions on Anodic Behavior of Nickel in Sulfuric Acid Solutions, by John Postlethwaite and Leonard B. Freese . . . . .	109
Errata: . . . . .	288
Errata . . . . .	115

## MAY

Role of Slip Step Emergence in the Early Stages of Stress Corrosion Cracking in Face Centered Iron-Nickel-Chromium Alloys, by T. J. Smith and R. W. Staehle. . . . .	117
Effect of Some Organic Phosphorus Compounds on the Corrosion of Low Carbon Steel in Hydrochloric Acid Solutions, by Z. Szklarska-Smialowska and B. Dus . . . . .	130
Stress Corrosion Cracking of High Strength Steels and Titanium Alloys in Chloride Solutions at Ambient Temperature, by M. H. Peterson, B. F. Brown, R. L. Newbegin and R. E. Groover . . . . .	142
A Technical Note-Compatibility of Two Ni-Ti Alloys with Mercury, by James Y. N. Wang. . . . .	149

## JUNE

Reference Electrodes in Acid and Base Systems, by Richard L. Every and William P. Banks. . . . .	151
Sulfide Stress Corrosion of Some Medium and Low Alloy Steels, by E. Snape. . . . .	154

## JUNE continued

Deformation Substructure and Susceptibility to Intergranular Stress Corrosion Cracking in an Aluminum Alloy, by H. A. Holl . . . . .	173
A Precision High Current Potentiostat, by Norman L. Conger and Olen L. Riggs, Jr. . . . .	181
Errata: . . . . .	288

## JULY

A Technical Note-Oxidation of Iron-Titanium Alloys at 1000 C in Air, by Gordon H. Geiger and J. Bruce Wagner, Jr. . . . .	185
Stress-Corrosion Characteristics of a Ti-7Al-2Cb-1Ta Alloy, by H. P. Leckie . . . . .	187
Tunnel Formation in Iron-Nickel-Chromium Alloys, by M. F. Dean, F. H. Beck and R. W. Staehle . . . . .	192
A Technical Note-Montage of Processes Operating During Stress Corrosion Cracking, by R. W. Staehle. . . . .	202
Anion Effect on Dissolution of Magnesium Metal in Aqueous Solutions, by J. W. Johnson, C. K. Chi and W. J. James. . . . .	204
Errata: . . . . .	288
Influence of Sulfur on the Corrosion Resistance of Austenitic Stainless Steel, by B. E. Wilde and J. S. Armijo . . . . .	208
Hydrogen Permeability of a Stable Austenitic Stainless Steel Under Anodic Polarization, by J. H. Shively, R. F. Hehemann and A. R. Troiano. . . . .	215
Effect of Potential and Stress on Time to Failure of Austenitic Stainless Steels in Magnesium Chloride Solutions, by M. Smialowski and M. Rychcik . . . . .	218

## AUGUST

Influence of Long Time Polarization on Anodic Breakdown of Titanium in Concentrated NaCl Solutions, by F. Mazza. . . . .	223
Errata: . . . . .	288

## AUGUST continued

Oxidation of Series of Dilute Zr Alloys at 500 C in Water Vapor Atmosphere Containing Trace Amounts of Oxygen, by Earl A. Gulbransen and Kenneth F. Andrew . . . . . 231

Anodic Behavior of Titanium and Commercial Alloys in Sulfuric Acid, by Milton Levy . . . . . 236

Effect of Temperature on Stress-Corrosion Fracture, by W. D. Sylwestrowicz . . . . . 245

Temperature Coefficient of Corrosion Inhibition, by Olen L. Riggs, Jr., and Ray M. Hurd . . . . . 252

## SEPTEMBER

Experience with Alclad Aluminum in Deep Sea Buoyancy Sphere, by Maurice W. Wei . . . . . 261

Influence of Alternating Current on Corrosion of Mild Steel: Behavior in 1 N Sulfuric Acid, by A. R. Yamuna and N. Subramanyan . . . . 264

Anodic Corrosion Characteristics of Aluminum 7075 and 7178, by A. H. Roebuck and J. V. Luhan . . . 268

Destructive Accumulation of Nitrogen in 30 Cr 20 Ni Cast Furnace Tubes in Hydrocarbon Cracking Service at 1100 C, by J. R. Schley and F. W. Bennett . . . . . 276

Errata . . . . . 288

## OCTOBER

Effects of Columbium in Steel on Elevated Temperature Hydrogen Attack, by R. E. Bisaro and G. H. Geiger . . . . . 289

Sulfuric Corrosion of Chromel-Alumel Thermocouples, by E. L. Creamer, I. Rozalsky and W. J. Lochmann . . . . . 297

Corrosion Resistance of Ti and a Ti-Pd Alloy in Hot, Concentrated Sodium Chloride Solutions, by Akira Takamura . . . . . 306

Boiling Temperatures of Mg Cl Solutions - Their Application in Stress Corrosion Studies, by Ina B. Casale . . . . . 314

Effect of Moisture on Decarburization and Fissuring of Steel by Hydrogen at Elevated Temperatures and Pressures, by J. Gutzeit and J. R. Thygeson, Jr. . . . . 318

Anodic Polarization Behavior of Titanium and Titanium Alloys in Sulfuric Acids, by J. M. Peters and J. R. Myers . . . . . 326

## NOVEMBER

An Assembly for Electrochemical Corrosion Studies in Aqueous Environments at High Temperature and Pressure, by B. E. Wilde . . . 331

Exfoliation and Stress-Corrosion Characteristics of High Strength, Heat Treatable Aluminum Alloy Plate, by B. W. Lifka, D. O. Sprowls and J. G. Kaufman . . . . . 335

Cathode Effects in Anodic Protection by J. M. Stammen and C. R. Townsend . 343

Use of Differential Capacitance Measurements to Predict the Inhibitive Behavior of Organic Nitrogen Compounds, by Benjamin Mosier and Gale B. Farquar . . . . 349

## DECEMBER

An Electrochemical Study of Aluminum Corrosion in Boiling High Purity Water, by R. A. Legault and J. E. Draley . . . . . 365

Simplified Procedure for Constructing Pourbaix Diagrams - A Technical Note, by Ellis D. Verink, Jr. . . . . 371

Corrosion of Prefilmed Zircaloy by Stanley Kass . . . . . 374

Index, Volume 23 . . . . . 385

# Alphabetical Subject Index

CORROSION, Vol. 23, 1967

AIR

vs Fe - Ti alloys, 1000C, 185  
Ti alloys stressed to SCC in, 189

ACIDS

Hydrochloric, 0.03 - 5 percent vs Ti with chlorides, 309  
" Inhibition of, Temperature coefficients, 40 - 85C, 252  
" vs LC steel, organic phosphorus compounds effect, 130  
Hydrofluoric influence on cracking Ta in 650 - 750C Hg, 105  
Nitric vs 14Cr - 14Ni - Fe, 209  
Phosphoric reference anodes for anodic protection in >115C, 151  
Sulfuric vs 14Cr - 14Ni - Fe, 209  
Sulfuric, hydrogen penetration of, 218  
Sulfuric, inhibition of, temperature coefficients, 40-85C, 252  
Sulfuric vs mild steel, influence AC 250 micro A - 100 Ma, 264  
Sulfuric vs 270 Ni, 27  
Sulfuric N/10 vs Ni, chlorides, bromides, iodides effect, 109  
Sulfuric vs steels, plus CO<sub>2</sub> inhibitors, 65  
Sulfuric vs Ti, effect of Fe and Cu additions, 239  
Sulfuric vs Ti 75A, 13V-11Cr-3Al, 6Al-6V-2Sn at 20C, 236  
Sulfuric vs Ti 75A, Ti-5Al-2.5Sn, Ti-6Al-4V, Ti-8Al-1Mo-1V, Ti-13V-11Cr-3Al, 326  
Sulfuric vs U 37-90C, 30

Alternating Current cycle frequency influence on steel vs H<sub>2</sub>SO<sub>4</sub>, 265  
Aging, influence SCC Al alloy: 120C, 176  
Ainsworth, 50  
Allihn, 316  
Alclad vs sea water, 261

ALUMINUM AND ALLOYS

1110 vs high purity water, 97C, 365  
2020, 24 vs 5% NaCl, pH<sub>3</sub>, 335  
2219 vs 5% NaCl, pH<sub>3</sub>, 335  
7075, 7178, electrochemical characteristics, 288  
7075, 79, 81, 7178 vs 5% NaCl, pH<sub>3</sub>, 335  
Alclad 7072-7172 vs sea water, 261  
Dislocations, influence SCC > 120C, 173  
Exfoliation vs pH<sub>3</sub>, 5% NaCl, 336  
vs Industrial atmospheres, 336  
Stress corrosion vs pH<sub>3</sub>, 5% NaCl, 336  
sea marine littoral environment, 336  
slip zones at low and high temperatures, 251  
tempera, influence on exfoliation, 335

Alternating current vs steel, mild in H<sub>2</sub>SO<sub>4</sub> 250 micro A to 100 Ma, 264  
Alfimal vs H<sub>2</sub>SO<sub>4</sub>, 649-816C, 297  
Ammonia vs O<sub>2</sub> in boiling water reactor, 57  
Anions effect vs Mg in aqueous solution, 204  
Annealing, influence on stress cracking 650-750C Hg on Cb-12r, 104  
Anodes, reference for anodic protection NaCl, H<sub>2</sub>PO<sub>4</sub> >115C, 151  
Anodic metals in aqueous salt solution, mechanisms, 15  
Anodic current, influence NaCl on 310 vs H<sub>2</sub>SO<sub>4</sub>, 215

A continued

ANODIC POLARIZATION

vs Ti in NaCl, 80C, 223  
Ti and alloys in H<sub>2</sub>SO<sub>4</sub> 22C, 326  
Measurements at 314C, 105.5 Kg/cm<sup>2</sup> vs 304 in chlorides, 333  
Anodic protection anodes, reference - for systems involving NaOH, H<sub>2</sub>PO<sub>4</sub>, >115C, 151  
Anodic protection, cathode effects in, 343  
Anotrol, 6, 27, 189, 269, 344  
Araldite, 264  
Astrocream Cement, 298  
Austenite, influence SCC steels in H<sub>2</sub>S, 165  
Autoclave Engineers, Ltd., 331

B

Baker and Adamson, 332  
Benzoquinoline inhibitors vs HCl, H<sub>2</sub>SO<sub>4</sub>, 256  
Beracryl, 224  
Beryllium vs aqueous salt solutions, mechanism, 15  
Beryllium in synthetic sea water vs stress >40,000 psi, 11  
Bismuth, influence of lead on corrosion 250-300C, 25  
Blisters, Alclad 7072 - 7178 vs sea water, 261  
Blisters Fe-30Cr 20 Ni tube vs 1100C steam, methane 4700 hrs., 281  
Brine acidified with H<sub>2</sub>S vs low and medium alloy steels, 80C, 115  
Bromide vs Ni in 10/N H<sub>2</sub>SO<sub>4</sub>, 111  
Buaya, Al vs sea water, 261  
Burnout of carbon in hydrocarbon cracking furnace tubes, 287

C

C-ring specimens, Al vs pH<sub>3</sub>, 5% NaCl, 340  
Calcium and Zinc aqueous salt solutions, mechanisms, 19  
Carbon influence SCC of steels vs H<sub>2</sub>S, 164  
CARBON DIOXIDE  
vs chromel-alumel thermocouples 649-816C, 298  
vs fatigue life steels in NaCl, H<sub>2</sub>S, 70  
vs Fe with alloy of 0.59-1.06% Ti, 1

CARBON MONOXIDE

vs Fe with alloy of 0.59-1.06% Ti, 1 vs chromel-alumel thermocouples 659-816C, 298  
Carbonization, hydrocarbon cracking furnace tubes, 280  
Cathode effects in anodic protection, 843  
Cathode location influence in anodic polarization, 343  
Cathodic charging, low C and alloy steels in H<sub>2</sub>S acidified brine, 155  
Cathodic polarization 1100 Al in high purity water, 97C, 365  
Cathodic polarization measurements at 289C, 333  
Cathodic protection of 4340 Al stressed in 3.5% NaCl, 145  
Ceramco, 298

C continued

Cobalt vs Hg, 500-750C, 98  
Cobalt base alloys X40, L605 vs 2900F JP4, sea salt, 73  
Columbium vs Hg, 500-750C, 98  
Columbium influence on Hg attack on Ferrovac 1020 at 510-580C, 1000-1400 psig, 289  
Columbium-12r vs Hg, stressed, 650-750C, 103  
Contimet, 223  
Chloride ion vs Ti in H<sub>2</sub>SO<sub>4</sub>, 239  
Chloride ion vs U, 30  
Chlorides NH<sub>4</sub>, Cu, Fe, Zn, Ca vs Ti, 309  
CHLORINE

Flowing vs Ti, 25-175C, 89  
vs Ti, water to inhibit, 88  
Ti tested for production of, 223

Chromel-alumel thermocouples vs 649-816C sulfur, 297  
Chromel vs sulfur 649-816C, 297

CHROMIUM

carbide reference anode, anodic protection vs sodium hydronide >115C, 151  
vs Hg, 500-750C, 98  
leaching by Hg from Fe-Cr alloys, 105  
Nitrogen, chromium influence solubility of, in 1100C steam, methane, 285  
vs sulfidation 2000 F, 80

Conax Corporation, 331  
Copper in Alclad diffusion zone, influence in sea water, 263  
Corning Glass Works, 332  
Cracking, SC of Al vs pH<sub>3</sub>, 5% NaCl, 338  
Crevice corrosion, Ti, TiPd in chlorides + HCl boiling, 306

D

Diffusion zone, ZnAl, corrosion in sea water, 262  
Dislocations, leading to tunnels in SS, Incoloy, Inconel in MgCl<sub>2</sub>, 194  
Dislocations, influence on SCC Al alloys >120C, 173  
Drierite, 188, 320  
Du Mont Laboratories, 344, 350  
Durite, 149

E

Electrochemical measurements in water cooled nuclear reactors, 379  
Electrochemical tests, Al 7075, 7178, 269  
Electrolyte bridge, high pressure, diagrams, 323, 333  
Emilecop, 174  
Eriochrome black-T, 205  
Exfoliation, Al 7075, 7178, 2024, 2219 etc. in pH<sub>3</sub>, 5% NaCl, 335  
Exfoliation tests, Al 7075, 7178, 269

F

Ferric chloride 10 wt% vs 14Cr-14Ni-Fe, 209  
Ferrovac 1020, 289  
Films effect on Zr 2.4 in 400C water, 374  
Films, Mg in acid and neutral electrolytes, 207

G

General Radio Co., 350, 381  
Geometry, anodic polarization, influence of cathode location, 343  
Gold-plated half cells in sodium dichromate dihydrate + 96% H<sub>2</sub>SO<sub>4</sub>, 153

GRAPHED DATA

304 over potential vs current density 289C high purity water 96 hrs, 382  
4340 stressed vs flowing sea water, 144  
10, 18% Ni stressed maraging steel in 3.5% NaCl, 144  
18Ni maraging steel, electrode potential variation w/time, 0.6N NaCl, 7  
Al pipe vs tap water, maximum pit depths, 84  
Benzoquinoline vs HCl, carbon steel, 255  
Beryllium, vs synthetic sea water, stress effect, 77F, 13  
" , pitting in synthetic sea water, 77F, 13  
Carbon steel and 304 in high purity water 289C, corrosion rate vs 500 hrs, 383  
" , steel potential vs current density in 289C high purity water, 540 hrs, 382  
" , steel influence ammonia in BWR, pressurized water, steam/water and separated steam, 61  
Cathodic charging, Ti in NaCl, Time vs potential, 190  
Cathodic protection potential vs stress 18% Ni maraging steel in 2.5% NaCl, 146  
Compositional coordinates, 400C isotherm, Fe-Ni-Cr systems, 199  
Contact material and environment, in slip step emergence, importance, 126  
Copper-beryllium vs ammonia, time vs plastic poststrain to form 0.1 mm crack, 249  
Crack growth rates vs time 4240, H-11 steels, 145  
Current density vs apparent valence Cd in salt water, 21  
Current density vs time to failure N80, 35-42R<sub>2</sub>, 157  
Grain size, effect on slip step emergence, 157  
Hastelloy X-280, evaporation vs time, 1120C, 54  
Haynes 25, evaporation 1120C vs time, 54  
Hydrogen absorption vs current density N-80 (R<sub>2</sub> 35), 157  
" , attack ratios, Co-treated vs C steel, 510-580C, 295  
" , evolution rates, Mg in H<sub>2</sub>SO<sub>4</sub>, HI, HBr, HCl, 205  
" , permeation vs maximum depth attack, 1000-1400 psig, 510-580, 292  
" , volume in LC steel vs HCl with organic phosphorus component, 132  
Methane fugacity vs wall thickness, 1000-1400 psig, 680C, 293  
Nitrate concentration vs apparent valence Cd in salt water, 21  
Organic inhibitors vs oilwell fluids, adsorption isotherms, 360, 361  
Oxygen vs Fe-Ti alloys, rates, 3  
" , Hastelloy X-280, 1120C, 51  
" , vs Haynes 25, 1120C, 51  
pH vs time-to-failure, N-80 35 and 42 R<sub>2</sub>, 157  
Pits, maximum depth distance, 12-in pipe, 12-yr exposure, 84



## G continued

### GRAPHED DATA continued

Polarized 1100 Al vs 97C high purity water, 22.5 hrs., 368  
Slip-step formation, 125  
", activated local dissolution, 126  
Stress vs H content N-80, 159  
Sulfidation kinetics, 300C lead vs 0.4 at/o Na, 25  
Thorium galvanic potential current vs H<sub>2</sub>SO<sub>4</sub> 25C, 37  
Time-to-tubing leas vs survival probability, 84  
Ti alloys in H<sub>2</sub>SO<sub>4</sub>, temperature effect on polarization, 238  
Ti vs Hooker cell chlorine, influence water content, 95, 96, 97  
U vs NaOH, effect chlorides on anodic potential 25C, 33  
", vs H<sub>2</sub>SO<sub>4</sub>, anion concentration, pH vs anodic polarization, 32  
Variation time-to-fracture vs temperature, 43  
Zr 2.4 vs 360-454C high purity water vs time, 376

Green Rot, chromel-alumel thermocouples, in 649-816C sulfur, 297

## H

Halides vs Ni in H<sub>2</sub>SO<sub>4</sub>, 109  
Hamilton, 88  
Hastelloy X vs 2000F JP4, sea salt, 74  
Hastelloy X-280, 50  
Haynes 25, 50, 51  
Heatkit Audio, 350  
Honeywell-Brown Pyro-Vane, Honeywell Instrument, 331  
Honeywell potentiometer, 381  
Humidity, influence SCC Ti alloys in air, 189  
Hydrocarbon cracking service, Ni vs Fe 30C/20Ni furnace tubes, 276  
Hydrocarbons vs Hastelloy X-280, Haynes 25, 1120C, 52

## HYDROGEN

310, penetration in NaCl, H<sub>2</sub>SO<sub>4</sub> under anodic current, 215  
Embrittlement 4340, H-11 in 3.5% NaCl, 145  
Embrittlement, Ti under cathodic charging, 191  
vs Ferrovac 1020, 510-580C, 1000-1400 psig, 289  
moisture, influence on nitack LC steel, 454-566C, 318  
vs Zr and alloys vs O<sub>2</sub> torr in water vapor 500C, 237 hrs., 232

Hydrogen sulfide vs chromel-alumel thermocouples 649-816C, 298  
Hydrogen sulfide vs low and medium alloy steels in acidified brine, SCC, 155  
Hypochlorite Ti tested for production of, 223

## I

Impedance bridge, use to test organic inhibitors, 349  
Inco 713, 72  
Incoloy, 600, 800, 825, vs MgCl<sub>2</sub>, 192  
Inconel, 59, 192

## INHIBITORS

Amines tested vs oilwell fluids 22-165C, 351  
vs HCl, H<sub>2</sub>SO<sub>4</sub> temperature coefficient, 40-85C, 252  
Imidazole vs oilwell fluids 22-165C, 351  
Napthenic acid vs oilwell fluids 22-165C, 351  
Organic vs H<sub>2</sub>S, CO<sub>2</sub>, NaCl, 65  
Ti in H<sub>2</sub>SO<sub>4</sub>, passivation of, 239  
Instron, 5, 174  
Intercrystalline fracture Cu, Be in ammonia, 246  
Intergranular SCC of Al alloy >120C, 173  
Iodides vs Ni in 10/N H<sub>2</sub>SO<sub>4</sub>, 112

## I continued

### IRON AND ALLOYS

Fe-30Cr-20Ni tubes vs 1100C steam, methanol, 276  
vs mercury 500-750C, 98  
- Ti alloy vs CO<sub>2</sub>, CO, 800-1100C, 1  
- Ti 0.51, 0.91, 1.55 w/o vs air, 1000C, 185

## J

JIS, 308  
JP4, w/ sea salt vs Ni, Co-base alloys, 2000F, 73

## K

K2, vs JP4, sea salt, 2000F, 73  
Kanthai - N vs H<sub>2</sub>S, 760C, 299  
Keithley, 6, 27, 224, 381

## L

Leeds and Northrup, 350  
Lithium sulfate vs gas turbine alloys, 2000F, 81  
Long traverse cracking Al alloys in NaCl, 335

## M

Magnaflux, 209  
Markal S-R-10, 298

### MAGNESIUM

vs aqueous salt solution, mechanism, 16  
vs Cl<sup>-</sup>, Br<sup>-</sup>, I<sup>-</sup>, NO<sub>3</sub><sup>-</sup>, SO<sub>4</sub><sup>2-</sup>, vs, 204  
Hg, influence vs Cl-12r at 650-750C, 105

### MAGNESIUM CHLORIDE

vs 302, 304 at 25-125C, 218  
vs 304, 309, 310, Incoloy 600, 800, Inconel 825, 192  
vs 14Cr-14Ni-Fe, 209  
vs 18-9 steels, 123-154C, 39  
boiling point determination, 315

### MECHANISM

Deformation influence SCC, 178  
Dislocations effect, Al Alloy SCC >120C, 173  
Electrochemistry, Al vs high purity water, 97C, 365  
Mg vs acid and neutral electrolytes, 207  
Metals vs aqueous salt solution, 15  
N vs Fe-30Cr-20Ni tubes, failure in steam, methane, 1100C, 284  
Organic inhibitor action, molecule's function, 349, 362  
O<sub>2</sub> vs Fe-Ti alloys, 1000C, 185  
Pd influence on Ti vs boiling chlorides, 312  
Slip step emergence in SCC, 120  
SCC CuBe, Al in ammonia, 251  
Sulfur 649-816C vs chromel-alumel thermocouples, 305  
Ti structure influence on rates in H<sub>2</sub>SO<sub>4</sub>, 244  
"Memory phenomenon" of Zr vs 454C water, stress, 374

### MERCURY

vs Fe, Cr, Ni, Co, N, Cb, Ta, Ti, Zr, 500-750C, 98  
vs Ni 46.8 and 25.5 Ti, 528C, 149  
Hg salts reference anode for anodic protection in NaOH and H<sub>2</sub>PO<sub>4</sub> acid >115C, 151  
Metal-sheathed ceramics vs sulfur, 649-816C, 305  
Methane, with steam vs Fe-30Cr-20Ni tube 1100C, 276  
", formation vs time and hydrogen pressure, 291  
Molybdenum-Mo oxide reference anodes for anodic protection in NaOH and H<sub>2</sub>PO<sub>4</sub> >115C, 151

## M continued

Monel 410 vs oxygen, nitrates in boiling water reactor, 59.

## N

### NICKEL AND ALLOYS

54 vs MgCl<sub>2</sub>, 117  
58 vs MgCl<sub>2</sub>, 117  
310 vs MgCl<sub>2</sub>, 127  
12 Ni maraging steel stressed vs 3.5% NaCl, 144  
18% welded Ni maraging steel stressed vs 3.5% NaCl, 144  
Cathodic protection stressed in NaCl, 146  
Inconel 600 vs O<sub>2</sub>, NiO<sub>2</sub> in boiling water reactor, 59  
IN-100, 713 vs JP4, sea salt 2000F, 74  
600, 800 Incoloy vs MgCl<sub>2</sub>, 192  
Fe-30Cr-20Ni tubes vs steam, methane 1100C, 276  
Ni on SCC steels, influence in H<sub>2</sub>S, 164  
vs mercury, 500-750C, 98  
vs Nitrogen influence on solubility in 1100C steam, methane, 285  
slip-steps' role in SCC, 117  
Sodium chloride, bromide, iodide vs deaerated N10 H<sub>2</sub>SO<sub>4</sub>, 109  
vs sulfur 649-816C, 303  
Nimonic, 304  
Nitrides in Fe-30Cr-20Ni tubes vs steam, methane 1100C, 277

### NITROGEN

270, capacitance measurements activation of passivity vs H<sub>2</sub>SO<sub>4</sub>, 27  
vs chromel-alumel thermocouples, 649-816C, 298  
vs Fe-30Cr-20Ni tubes steam, methane 1100C, 276  
vs Haynes 25, Hastelloy X 280, 1120C, 53  
vs steels, monel, Inconel, 57

Nuclear reactors boiling water, ammonia vs O<sub>2</sub>, 57  
", measurements in water cooled, 379

## O

### OXYGEN

vs chromel-alumel thermocouples 649-816C, 298  
vs Cu Be stressed in ammonia, 245  
vs Hastelloy X-280, 1120C, 51  
vs Haynes, 25, 1120C, 51  
vs Ti in NaCl, 223  
vs Ti in 2.5% NaCl + 2.1 mol/l HCl, 90C, 312  
vs Zircaloy 2.4; Zr 1-0Cr-1.3Ni and 5.0V, 500C, 237 hrs., 1-12ppm, 231

Oxide scales, Fe-Ti vs 1000C air, 186

## P

Petroleum, testing inhibitors used in production, 349  
Phillips, 118, 193, 264  
Phosphorus-organic compounds vs HCl and LC steel, 25-75C, 130  
Phosphorus, role in SCC, 117  
Pit depth, statistical analysis, 83  
Platinum anodes in polarization tests, 367  
Platinum-clad electrodes, anodic protection tests, 344  
Polarization measurements, water cooled nuclear reactor environments, 379  
Potential, influence on time-to-failure austenitic 302, 304 in MgCl<sub>2</sub>, 25-125C, 218  
Potentiostat, description precision high current, 181  
Pourbaix diagrams, construction of, 371  
Power Eng. and Equipment Co. 331  
Power Design, Inc. 381  
Pre-cracking, effect on SCC rate, 148

### PRESSURE, HIGH

105.5 kg/cm<sup>2</sup> vs AISI 304 in chlorides,

## P continued

314C, 331  
1500 psi high purity water, steam vs Zr 2.4, 375  
1000 psi vs 304 high purity water, 289C, 379  
1000 psi vs C steel, high purity water, 289C, 379

## Q

Quenching of Al alloy, influence on SCC, 179

## R

Regatran, 188  
Rubicon, 350

## S

Salt, sea, influence in JP4 vs Ni, Co-base alloys 2000F, 73  
Sargent Ampol, 350  
Sargent, E. H. & Co., 344  
Scratching, influence on Ti in chlorine, 25-175C, 88  
SEL 15 vs JP4, sea salt, 2000F, 74  
Short traverse cracking Al alloys in NaCl, 335  
Silicon, role in SCC, 117  
Silver, influence SCC Al alloy, 179  
Singer Metric Division, 381  
Slip steps precedent to tunnels in SS, Incoloy, Nimel, 192  
Slip steps' role in SCC Fe Ni Cr alloys, 117  
Sodium vs lead, influence 250-300C, 24

### SODIUM CHLORIDE

vs 310, hydrogen penetration, 215  
vs Al 7075, 79, 01, 7178, 2020, 24, 2219, 335  
inhibitors tested vs 22-165C, 349  
vs Ni in N10 H<sub>2</sub>SO<sub>4</sub>, 110  
vs steels, fatigue w/H<sub>2</sub>S, CO<sub>2</sub>, 65  
vs Ti-7 Al-3Cu-1Ta stressed in HCl or NaOH, 188  
vs Ti and alloys in H<sub>2</sub>SO<sub>4</sub>, 20C, 240  
Ti anodically polarized in 5.3M, 80C, 223

Sodium hydroxide anodes, reference for anodic protection >115C, 151  
Sodium perchlorate in electrolyte, 353  
Specimen configurations Al, for exfoliation and stress corrosion tests, 336  
Spray test, accelerated acidified, NaCl vs Al, 337  
Starrett, 188  
Statistical analysis of pit depths, time-to-first penetration, 83  
Steam, with methane vs Fe-30Cr-20Ni tube 1100C, 276  
", vs Zr 2.4 in high purity water, 454C, 374

### STEEL

1010 vs O<sub>2</sub> nitrogen, ammonia in boiling water reactors, 57  
4340 stressed vs sea water 143  
A 387-64 vs O<sub>2</sub> nitrogen, ammonia in boiling water reactor, 59  
Carbon vs 289C high purity water 1000psi, 379  
Ferrovac 1020 vs hydrogen 510-580C 1000-1400 psig 289  
vs HCl, phosphorus organic compounds effect, 25-75C, 130  
inhibitors vs H<sub>2</sub>SO<sub>4</sub> and HCl, temperature coefficient, 40-85C, 254  
vs moisture, 100-450ppm influence with hydrogen, 454-566C 318  
low, medium alloy vs H<sub>2</sub>S, acidified brine, SCC, 115  
mild, influence 259 micro A-100MA vs H<sub>2</sub>SO<sub>4</sub>, 264  
14Cr 14Ni vs H<sub>2</sub>SO<sub>4</sub>, HNO<sub>3</sub>, FeCl<sub>3</sub>, MgCl<sub>2</sub>, 209  
18 Ni maraging vs CO<sub>2</sub>-CO, 800-1100C, 1  
18-9 vs MgCl<sub>2</sub>, 123-154C, 39  
302, 304 influence potential and stress on failure vs MgCl<sub>2</sub>, 218  
304, 309, 310, tunnels in MgCl<sub>2</sub>, 192  
304 vs chlorides, 314C, 105.5 kg/cm<sup>2</sup>, 331  
304 vs O<sub>2</sub>, N, NH<sub>3</sub> in boiling water reactor, 59

## S continued

304 vs 70%  $H_2SO_4$ , 153  
304 vs  $H_2SO_4$ ,  $HNO_3$ ,  $FeCl_3$ ,  $MgCl_2$ , 213  
304 vs high purity water, 289C 1000 psi, 379  
310 vs  $NaCl$ ,  $H_2SO_4$ , 215  
316 vs  $H_2SO_4$ ,  $HNO_3$ ,  $FeCl_3$ ,  $MgCl_2$ , 213  
410 vs  $O_2$ ,  $N$ ,  $NH_3$  in boiling water reactor, 59  
Tunnels in austenitic alloys without  $Cl$  ions and SCC, 107

Stress, influence on time-to-failure  
austenitic 302, 304 in  $MgCl_2$ , 25-125C, 218  
Stress, influence on recovery N-80 after exposure to  $H_2S$ , 159

## STRESS CORROSION

18-9 steels, austenitic vs  $MgCl_2$ , 39  
Al 7075 vs  $NaCl$ , 272  
Al 7075, 7170, 2024, 2219 etc in pH 3, 5%  $NaCl$ , 335  
Chromel-alumel wires in air, nitrogen, hydrogen, sulfide 760-810C, 299  
Copper-1.8 Be-0.3 Co in ammonia -20, 30 and 90C, 245  
Sulfur influence vs  $H_2SO_4$ ,  $HNO_3$ ,  $FeCl_3$ ,  $MgCl_2$ , 213  
Ti-7Al-2Cr-1Ta alloy vs 3%  $NaCl$  +  $HCl$  with sodium hydroxide, 188

## STRESS CORROSION CRACKING

Al alloy, influence of dislocations >120C, 173  
Cb 1 Zr in Hg 650-750C, 104  
N-80 susceptibility vs hardness in  $H_2S$ , 159  
4340 vs sea water 142  
CuBe vs ammonia, time-to-formation 0.1 mm cracks, 247  
Montage of processes in metal and environment, 203  
Steels, medium, low alloy in  $H_2S$  + acidified brine, 155  
Ti alloys in sea water, 147  
Transgranular of Be in synthetic sea water, 11  
Tunnels in austenitic alloys without, 107

Sulfidation gas turbine alloys, 2000F, 80

## SULFUR

vs 14Cr-14Ni-Fe austenitic,  $H_2SO_4$ ,  $HNO_3$ ,  $FeCl_3$ ,  $MgCl_2$ , 209  
vs chromel-alumel thermocouples, 649-816C, 297  
vs lead, 250, 275, 300C, 24  
vs Ni, Co-base alloys, influence Na, 2000F, 80

## T

### TABULATED DATA

18 Ni maraging steel, current density, micro A/cm<sup>2</sup>, 0.6N  $NaCl$ , 9  
Hydrogen vs LC steel 1000 psi, incubation period activation energies, 323  
Inhibitor % protection vs concentration fatigue life, steels in  $NaCl$ ,  $H_2S$ ,  $CO_2$ , 67  
Reactor, boiling water rates vs steels, Monel, 404, Inconel 600, influence of ammonia, 60  
Steel, LC, vs  $HCl$ , rate vs inhibitor concentration, 132, 133  
Sulfide cracking resistance low, medium steels vs strength, composition, heat treatment, 160  
Ti, breakdown voltages in  $NaCl$ ,  $HCl$ , 225  
Ti vs chlorine, 92  
Uranium vs  $H_2SO_4$  wt loss at 0.5V, 33  
Zr vs 550, 600, 680, 750F high purity water vs time, 377, 378  
Zr vs 92 torr water 648 torr helium + 112 ppm  $O_2$ , 500C, 236 hrs. crystal structures, 235  
Tacsussel, 131  
Tallow diamine inhibitor, 355  
Tantalum vs mercury 500-750C, 98  
Tantalum, stress cracking in mercury 650-750C, 195  
Teflon, 306, 331

### TEMPERATURE

120C vs stressed CuBe in ammonia, 245  
30-90C, stressed CuBe vs ammonia, 245  
40-85C, influence inhibitors in  $H_2SO_4$ ,  $HCl$ , 252  
100-154C vs time-to-fracture 18-9 steels in  $MgCl_2$ , 42  
vs Cu-1.8 Be-0.3 Co stressed in ammonia, -20; 30-90C, 245  
Ti vs chlorine, influence, 88

### TEMPERATURE HIGH

165C inhibitors organic oilwell, 359  
289C vs C steel, high purity water 1000 psi, 379  
289 vs 304 in high purity water 1000 psi, 379  
314C (598F) 105.5 kg/cm<sup>2</sup> vs AISI 304 in dilute chlorides, 331  
454-566C hydrogen vs LC steel, effect moisture 100-450 ppm, 318  
500-750C vs Fe, Cr, Ni, Co, V, Cb, Ta, Ti, Zr, 98  
Zr alloys vs 500C, 237 hrs.  $O_2$ , 112 ppm, 231  
510-580C vs hydrogen 1000-1400 psig, 289  
538C mercury vs Ni-46.8 and 25.5Ti, 149  
649-816C sulfur vs chromel-alumel thermocouples, 297  
800-1100C, vs Fe-Ti alloys, 1  
1000C air vs Fe-Ti alloys, 185

## T continued

1093C vs Ni, Co-base alloys, JP4, sea salt, 73  
1100C steam, methane vs Fe-30Cr-20Ni tube, 276  
1120C vs Haynes 25, Hastelloy X-289 thermal cycling,  $O_2$ , methane, 53  
1200C,  $O_2$ ,  $CO$ ,  $CO_2$ , water vapor, methane vs Haynes 25, Hastelloy X-280, 50

Testing atmosphere, Al alloys vs industrial, 336  
Testing, atmosphere, Al vs sea marine, 336

## TESTING, LABORATORY

Accelerated, oil well inhibitors, 349  
Accelerated, Al alloys vs pH<sub>2</sub>, 5%  $NaCl$ , 335  
Al, alternate immersion, 337  
Electrochemical measurements at 314C, 105.5 kg/cm<sup>2</sup>, 331  
Polarization, high purity water, 367  
Polarization, high purity water, 289C, 1000 psi, 379  
Steel, carbon in 289 C high purity water, 1000 psi, 379  
Inhibitors, organic via impedance bridge, 349  
Inhibitors, organic vs oilwell fluids, 22-165C, 349  
Tygon, 332

## TITANIUM AND ALLOYS

0.51, 0.91, 1.55 w/o vs air, 1000C, 185  
-7Al-2Cb-1Ta stressed vs 3%  $NaCl$  +  $HCl$  and  $NaOH$ , 188  
46.8 and 25.5 w/Ni vs Hg 538C, 149  
75A, Ti-5Al-2.5 Sn, Ti-6Al-4V, Ti-8Al-1Mo-1V, Ti-13V-11Cr-3Al vs  $H_2SO_4$ , 22C, 326  
Thorium vs acids 25, 90C, 35  
Thorium vs alkalis,  $NaOH$  37C, 37  
"Threshold" stresses for Al/alternate immersion, 340

## TIME-TO-FRACTURE

$MgCl_2$  154-170C vs time, 47  
 $MgCl_2$  vs diameter of specimen, 49  
 $MgCl_2$  vs specimen surface condition, 47  
Transcrystalline fracture CuBe in ammonia, 246

Trygon Electronics, Inc., 224

Tubes, Fe-30Cr-20Ni, rupture in steam methane 1100C, 276  
Tungsten, tungsten oxide vs  $NaOH$  >115C, 153  
Tunnel formation Fe-NiCr alloys vs  $MgCl_2$ : 304, 309, 310 and Inconel 600, 800, Nickel 825, 192  
Turbines, gas vs Ni, Co-base alloys, Hastelloy X vs JP4, sea salt, 2000F, 72

## T continued

75A, 13V-11Cr-3Al, 6Al-6V-2Sn vs  $H_2SO_4$ , 236  
Alloying element, effect on structure, 242  
vs chlorides,  $CaCl_2$ ,  $ZnCl_2$ ,  $NH_4Cl$ ,  $CuCl_2$ ,  $FeCl_3$  +  $HCl$ , boiling, 309, 311  
Chloride ions effect in  $H_2SO_4$ , 239  
vs chlorine, water for inhibition, 25-175C, 88  
Fe, alloys vs  $CO-CO_2$ , 800-1100C, 1  
Fe and Cu additions effect  $H_2SO_4$  vs Ti and alloys, 20C, 239  
vs mercury 500-750C, 98  
Pitting in boiling chlorides, 312  
vs sodium chloride, anodic breakdown, 223  
+ TiPd vs 86%  $ZnCl_2$ , 308  
+ TiPd vs  $MgCl_2$ , 42%, boiling, 307  
+ TiPd vs 61%  $CuCl_2$ , 308  
vs water, sea, stressed, 146

## U

U. S. Stoneware, 332  
Uranium vs nitric, sulfuric acids, sodium hydroxide, 29

## V

Vacuum vs Haynes 25, Hastelloy X-280, evaporation at 1120 C vs  $O_2$ , 54  
Valdres-tilting stage, 174  
Vanadium vs Hg, 500-750C, 98  
Vycor, 100

## W

Wenking, 44  
Waring, 151

## WATER

Polarization measurement at 289C, 1000 psi, 379  
High purity vs 1100 Al, 97C, 18 megohm, 368  
Inhibitive effect in chlorine to protect Ti 25-175C, 88  
Moisture, 100-450 ppm, influence on hydrogen attack on LC steel, 454-566C, 318  
Salt vs Be, stress >40,000, 11  
Sea vs Ti alloys, stressed, 146  
Sea vs stressed 4340, 143  
Ultra pure, ammonia vs  $O_2$  in, 57  
Vapor 92 torr + 648 torr He + 112 ppm  $O_2$  vs Zr and alloys, 231

## Z

### ZIRCONIUM AND ALLOYS

vs mercury, 500-750C, 98  
Zircaloy 2.4 vs water, steam, 400C, 374  
Zircaloy 2, 4: Zr-1.0Cr; -1.3Ni; -5.0V, 237 hrs. vs  $O_2$ , 112 ppm, 500C, 231  
Zircaloy 2.4, effect of prefilming, 374

# Alphabetical Author Index

CORROSION, Vol. 23, 1967

## A

Andrew, Kenneth F.  
See Earl A. Gulbransen. . . . . 231

Armijo, J. S.  
See B. E. Wilde. . . . . 206

Armijo, J. S.  
A Technical Note - Corrosion  
Tunnels in Stainless Steels, with  
B. E. Wilde. . . . . 107

## B

Banks, William P.  
See Richard L. Every. . . . . 151

Beck, F. H.  
See M. F. Dean. . . . . 192

Bennett, F. W.  
See J. R. Schley. . . . . 276

Bergman, P. A.  
Hot Corrosion of Gas Turbine Alloys. . 72

Bisaro, R. E.  
Effects of Columbium in Steel on  
Elevated Temperature Hydrogen  
Attack, with G. H. Geiger. . . . . 289

Brown, B. F.  
See M. H. Peterson. . . . . 142

Bryant, P. E. C.  
See L. E. LeSurf. . . . . 57

## C

Casale, Ina B.  
Boiling Temperatures of Mg Cl  
Solutions-Their Application in  
Stress Corrosion Studies. . . . . 314

Charlot, L. A.  
High Temperature Corrosion and  
Evaporation of Haynes 25 and  
Hastelloy X-280, with R. E.  
Westerman. . . . . 50

Chi, C. K.  
See J. W. Johnson. . . . . 204

Conger, Norman L.  
A Precision High Current Potentiostat,  
with Olen L. Riggs, Jr. . . . . 181

Creamer, E. L.  
Sulfuric Corrosion of Chromel-Alumel  
Thermocouples, with I. Rozalsky and  
W. J. Lochmann. . . . . 297

## D

Dean, M. F.  
Tunnel Formation in Iron-Nickel-  
Chromium Alloys, with F. H. Beck  
and R. W. Staehle. . . . . 192

Draley, J. E.  
See R. A. Legault. . . . . 365

Dus, B.  
See Z. Szklarska-Smialowska. . . . . 130

## E

Errata. . . . . . 14, 115, 288

Every, Richard L.  
Reference Electrodes in Acid and Base  
Systems, with William P. Banks. . . 151

## F

Farquar, Gale B.  
See Benjamin Mosier. . . . . 349

Finley, Howard F.  
An Extreme-Value Statistical Analysis  
of Maximum Pit Depths and Time to  
First Perforation. . . . . 83

Fradin, Frank  
Reaction Rate of Sulfur With Lead -  
A Technical Note, with  
J. Bruce Wagner, Jr. . . . . 24

Freese, Leonard B.  
See John Postlethwaite. . . . . 109

## G

Geiger, Gordon H.  
Oxidation of Fe-Ti Alloys in  
CO-CO<sub>2</sub> Mixtures, with  
J. Bruce Wagner, Jr. . . . . 1  
A Technical Note - Oxidation of  
Iron-Titanium Alloys at 1000 C  
in Air, with J. Bruce Wagner, Jr. . . 185  
See R. E. Bisaro. . . . . 289

Green, J. A. S.  
Relationships Between Electrochemical  
Measurements and Stress Corrosion  
Cracking of Maraging Steel, with  
E. G. Haney. . . . . 5

Greene, N. D.  
See L. E. Kindlimann. . . . . 29

Groover, R. E.  
See M. H. Peterson. . . . . 142

## G continued

Gulbransen, Earl A.  
Oxidation of Series of Dilute Zr  
Alloys at 500 C in Water Vapor  
Atmosphere Containing Trace  
Amounts of Oxygen with  
Kenneth F. Andrew. . . . . 231

Gutzeit, J.  
Effect of Moisture on Decarburization  
and Fissuring of Steel by Hydrogen  
at Elevated Temperatures and  
Pressures, with J. R. Thygeson, Jr. 318

## H

Haney, E. G.  
See J. A. S. Green. . . . . 5

Hehemann, R. F.  
See J. H. Shively. . . . . 215

Holl, H. A.  
Deformation Substructure and  
Susceptibility to Intergranular  
Stress Corrosion Cracking in  
an Aluminum Alloy. . . . . 173

Hurd, Ray M.  
See Olen L. Riggs, Jr. . . . . 252

## I

James, William J.  
Anodic Disintegration of Metals  
Undergoing Electrolysis in  
Aqueous Salt Solutions, with  
M. E. Straumanis and J. W.  
Johnson. . . . . 15  
See J. W. Johnson. . . . . 204

## J

Johnson, J. W.  
Anion Effect on Dissolution of  
Magnesium Metal in Aqueous  
Solutions, with C. K. Chi and  
W. J. James. . . . . 204  
See William J. James. . . . . 15

## K

Kass, Stanley  
Corrosion of Prefilmed Zircaloy. . . 374

Kaufman, J. G.  
See B. W. Lifka. . . . . 335

Kindlimann, L. E.  
Dissolution Kinetics of Nuclear Fuels 1.  
Uranium 2. Thorium, with  
N. D. Greene. . . . . 29



## K continued

- Kleinman, M. H.  
See Millaway, E. E. . . . . 88

- Kohl, Heinz  
A Contribution to the Examination of  
Stress Corrosion Cracking of Aus-  
tenitic Stainless Steels in Magnesium  
Chloride Solutions. . . . . 39

## L

- Landers, J. E.  
See Parviz Mehdizadeh . . . . . 65

- Leckie, H. P.  
Stress-Corrosion Characteristics  
of a Ti-7 Al-2Cb-1Ta Alloy . . . . 187

- Legault, R. A.  
An Electrochemical study of Al  
Corrosion in Boiling High-Purity  
Water, with J. E. Draley. . . . . 365

- Le Surf, L. E.  
Use of Ammonia to Suppress Oxygen  
Production and Corrosion in  
Boiling-Water Reactors, with  
P. E. C. Bryant and M. C.  
Tanner. . . . . 57

- Levy, Milton  
Anodic Behavior of Titanium and  
Commercial Alloys in Sulfuric  
Acid . . . . . 236

- Lifka, B. W.  
Exfoliation and Stress-Corrosion  
Characteristics of High Strength,  
Heat Treatable Aluminum Alloy  
Plate, with D. O. Sprowls and  
J. G. Kaufman . . . . . 335

- Lochmann, W. J.  
See E. L. Creamer . . . . . 297

- Luhan, J. V.  
See A. H. Roebuck . . . . . 268

## M

- Mazza, F.  
Influence of Long Time Polarization  
on Anodic Breakdown of Titanium  
in Concentrated NaCl Solutions. . . 223

- McGlasson, R. L.  
See Parviz Mehdizadeh . . . . . 65

- Mehdizadeh, Parviz  
Effect of Organic Corrosion  
Inhibitors on Corrosion Fatigue,  
with R. L. McGlasson and  
J. E. Landers. . . . . 65

- Millaway, E. E.  
Factors Affecting Water Content  
Needed to Passivate Titanium in  
Chlorine, with M. H. Kleinman . . 88

## M continued

- Miller, R. A.  
Stress Corrosion of Beryllium in  
Synthetic Sea Water, with J. R.  
Myers and R. K. Saxer. . . . . 11

- Mosier, Benjamin  
Use of Differential Capacitance  
Measurements to Predict the  
Inhibitive Behavior of Organic  
Nitrogen Compounds, with  
Gale B. Farquar . . . . . 349

- Myers, J. R.  
See J. M. Peters. . . . . 326

- Myers, J. R.  
See R. A. Miller . . . . . 11

## N

- Neill, William J.  
Discussion. . . . . 287

- Newbegin, R. L.  
See M. H. Peterson. . . . . 142

- Nobe, Ken  
See R. R. Sayano . . . . . 14

## P

- Peters, J. M.  
Anodic Polarization Behavior of  
Titanium and Titanium Alloys in  
Sulfuric Acids, with J. R. Myers . . 326

- Peterson, M. H.  
Stress Corrosion Cracking of High  
Strength Steels and Titanium Alloys  
in Chloride Solutions at Ambient  
Temperatures, with B. F. Brown  
R. L. Newbegin and R. E.  
Groover. . . . . 142

- Postlethwaite, John  
Effect of Halide Additions on Anodic  
Behavior of Nickel in Sulfuric  
Acid Solutions, with Leonard  
B. Freese . . . . . 109

## R

- Riggs, Olen L., Jr.  
Temperature Coefficient of  
Corrosion Inhibition with Ray  
M. Hurd . . . . . 252  
See Norman L. Conger. . . . . 181

- Robuck, A. H.  
Anodic Corrosion Characteristics  
of Aluminum 7075 and 7178  
with J. V. Luhan. . . . . 268

- Rozalsky, I.  
See E. L. Creamer. . . . . 297

- Rychcik, M.  
See M. Smialowski . . . . . 218

## S

- Saxer, R. K.  
See R. A. Miller . . . . . 11

- Sayano, R. R.  
Capacitance Measurements During  
Activation of Passive Nickel - A  
Technical Note, with Ken Kobe . . . 27

- Schley, J. R.  
Destructive Accumulation of Nitrogen  
in 30 Cr 20 Ni Cast Furnace Tubes  
in Hydrocarbon Cracking Service  
at 1100 C with F. W. Bennett. . . . 276

- Shively, J. H.  
Hydrogen Permeability of a Stable  
Austenitic Stainless Steel Under  
Anodic Polarization, with R. F.  
Hehemann and A. R. Troiano. . . . 215

- Smialowski, M.  
Effect of Potential and Stress on Time  
to Failure of Austenitic Stainless  
Steels in Magnesium Chloride  
Solutions, with M. Rychcik. . . . . 218

- Smith, T. J.  
Role of Slip Step Emergence in the  
Early Stages of Stress Corrosion  
Cracking in Face Centered Iron-  
Nickel-Chromium Alloys, with  
R. W. Staehle. . . . . 117

- Snappe, E.  
Sulfide Stress Corrosion of Some  
Medium and Low Alloy Steels. . . . 154

- Sprowls, D. O.  
See B. W. Lifka. . . . . 335

- Staehle, R. W.  
A Technical Note-Montage of Processes  
Operating During Stress Corrosion  
Cracking . . . . . 202  
See T. J. Smith. . . . . 117  
See M. F. Dean . . . . . 192

- Stammen, J. M.  
Cathode Effects in Anodic Protection  
with C. R. Townsend . . . . . 345

- Straumanis, M. E.  
See William J. James. . . . . 15

- Subramanyan, N.  
See A. R. Yamuna . . . . . 264

- Sylwestrowicz, W. D.  
Effect of Temperature on Stress-  
Corrosion Fracture. . . . . 245

- Szklarska-Smialowska, Z.  
Effect of Some Organic Phosphorus  
Compounds on the Corrosion of  
Low Carbon Steel in Hydrochloric  
Acid Solutions, with B. Dus . . . . 130

## T

- Takamura, Akira  
Corrosion Resistance of Ti and a  
Ti-Pd Alloy in Hot, Concentrated  
Sodium Chloride Solutions . . . . . 306

- Tanner, M. C.  
See L. E. LeSurf . . . . . 57

- Tassinari, S. J. . . . . . 106

- Thygeson, J. R., Jr.  
See J. Gutzeit . . . . . 318

- Townsend, C. R.  
See J. M. Stammen . . . . . 343

- Troiano, A. R.  
See J. H. Shively . . . . . 215

## V

- Verink, Ellis D.  
Simplified Procedure for Constructing  
Pourbaux Diagrams-A Technical  
Note . . . . . 371

## W

- Wagner, J. Bruce, Jr.  
See Frank Fradin . . . . . 24  
See Gordon H. Geiger . . . . . 1, 185

- Wang, James Y. N.  
A Technical Note-Compatibility of  
Two Ni-Ti Alloys with Mercury . . . 149

- Weeks, John R.  
Liquidus Curves and Corrosion of  
Fe, Cr, Ni, Co, V, Cb, Ta, Ti, and  
Zr in 500-750 C Mercury . . . . . 98

- Wei, Maurice W.  
Experience with Alclad Aluminum in  
Deep Sea Buoyancy Sphere . . . . . 261

## W continued

- Westerman, R. E.  
See L. A. Charlot . . . . . 50

- Wilde, B. E.  
An Assembly for Electrochemical  
Corrosion Studies in Aqueous  
Environments at High Temperature  
and Pressure . . . . . 331

- Wilde, B. E.  
Influence of Sulfur on the Corrosion  
Resistance of Austenitic Stainless  
Steel, with J. S. Armijo . . . . . 208  
See J. S. Armijo . . . . . 107

## Y

- Yamuna, A. R.  
Influence of Alternating Current on  
Corrosion of Mild Steel: Behavior  
in 1 N Sulfuric Acid, with N.  
Subramanyan . . . . . 264

### ADD TO AUTHOR INDEX

WILDE, B. E.

Adaptation of Linear Polarization  
Techniques for in - Situ Corrosion  
Measurements in Water Cooled  
Nuclear Reactor Environments . . . . 379

## ERRATA

Effect of Halide Solutions on Anodic Behavior of Nickel in Sulfuric Acid Solutions. CORROSION, Vol. 23, No. 4, 109-114 (1967) April

For Figure 9 on Page 113, substitute the figure and cutlines below:

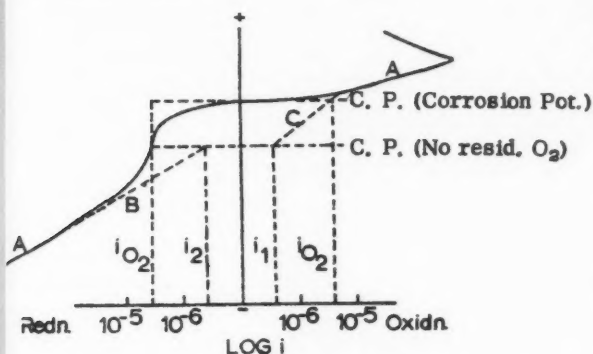


Figure 9 - (A.) Electrolysis curve (B.) Polarization curve for hydrogen evolution (C.) Polarization curve for Nickel dissolution.

Influence of Long Time Polarization on Anodic Breakdown of Titanium in Concentrated NaCl Solutions. CORROSION, Vol. 23, No. 8, 223-230 (1967) August.

On Page 226, substitute the cutlines below for those appearing below Figure 3:

Figure 3 - Anodic behavior and breakdown voltages of titanium in various solutions at 80 C.

- 0.1 M HCl
- 0.5 M HCl
- 1.0 M HCl
- ▲ 5.3 M NaCl
- △ 5.3 M NaCl + 0.3 M HCl

Anion Effect on Dissolution of Magnesium Metal in Aqueous Solutions. CORROSION, Vol. 23, No. 7, 204-207 (1967) July.

On Page 205 substitute for the cutlines under Figure 1 revised cutlines hereunder. On Page 206, substitute for the cutlines under Figures 2 and 3 the revised cutlines hereunder.

Figure 1 - Hydrogen evolution rate for magnesium dissolving in various acids at 25 C. (▲, H<sub>2</sub>SO<sub>4</sub>; ○, HI; △, HBr; ●, HCl.)

Figure 2 - Apparent valence of magnesium dissolving anodically in various 1 N salt solutions at 25 C. (▲, K<sub>2</sub>SO<sub>4</sub>; ○, KI; △, KBr; ●, KCl; □, KNO<sub>3</sub>.)

Figure 3 - Overpotential-current relationships for the magnesium anode in various 1 N salt solutions at 25 C. (▲, K<sub>2</sub>SO<sub>4</sub>; ○, KI; △, KBr; ●, KCl; □, KNO<sub>3</sub>.)

A Precision High Current Potentiostat. By Norman L. Conger and Olen L. Riggs, Jr. CORROSION, Vol. 23, No. 6, 181-184 (1967) June.

To the parts list at the bottom of Figure 3 on Page 182 add the following:

- R14 -- 75K
- V<sub>1</sub> -- 6DJ8
- V<sub>2</sub> -- 6Z67
- V<sub>3</sub> -- 6DJ8
- V<sub>4</sub> -- OBZ
- V<sub>5</sub> -- 6DJ8
- V<sub>6</sub> -- 12AX7

Boiling Temperatures of MgCl<sub>2</sub> Solutions -- Their Application in Stress Corrosion Studies. By Ina B. Casale. Vol. 23, No. 10, 314-317 (1967) Oct.

On Page 315, second column, under "References", for Reference 3, substitute the following:

- 3. V. K. Pershke and D. Van Rooyen, J. Electrochem. Soc., Vol. 108, No. 3, 222-29 (1961).